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APPLICATION NO.	FILED DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/075,709	02/14/2002	Paul Altom	06160-1P66	8180
557	7590	01/28/2004	EXAMINER	
BAYER POLYMERS LLC 100 BAYER ROAD PITTSBURGH, PA 15205			MCDONALD, RODNEY GLENN	
			ART UNIT	PAPER NUMBER
			1753	

DATE MAILED: 01/29/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/075,709

Examiner

Rodney G. McDonald

Applicant(s)

AIMONE ET AL.

Art Unit

1753

The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

## A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 20 October 2003.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-13 and 15-24 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-13 and 15-24 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
- a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

### Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-162)
- 6) ☐ Other:

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1 -6, 8-13 and 15-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wollenberg (DE 199 25 330 A1) in view of Nakagama et al. (EP 0 834 594) and Michaluk et al. (WO 00/31 31 0).

Wollenberg teach a sputter target production or recycling, using an overhead moving IR source (2) to melt target material on a cast plate (3) or worn target region. (See Abstract)

A sputter target production or recycling process comprises covering a cast plate (3) or worn target region pieces with target material pieces or melt and then supplying

heat from an IR emitter (2) which is passed over the target material (1) to effect complete melting and then solidification of the target material. (See Abstract; Figures 1 and 2) In Figure 2 the target 1 is attached to a backing plate 3 with IR emitter 2 supplying the heat to recycle the target material. (See Figure 2) The IR emitter is believed to encompass IR emitters such as infrared lasers.

The differences between Wollenberg and the present claims is that the target being made of tantalum is not discussed, utilizing metal powder particles to for melting for recycling is not discussed, the particles having the same microstructure is not discussed, removing excess material by machining, sanding or abrasion etching is not discussed, utilizing a laser beam is not discussed, utilizing an electron beam is not discussed, utilizing a vacuum atmosphere is not discussed, utilizing an inert atmosphere is not discussed and utilizing a foil is not discussed.

As to the utilization of a laser beam it is believed that an IR heater encompasses an infrared laser beam heating device. (See Wollenberg above) As to the utilization of a foil since Wollenberg broadly disclose filling the worn target region with metal pieces It is believed that metal pieces such as foils powders, etc would serve the purpose of filling the worn target region during the recycling process. (See Wollenberg et al. discussed above)

Nakagama et al. teach a process for producing sputtering targets, which comprises molding a mixture of a powder of a high-melting point substance having a melting point of 900 degrees C or above with a powder of a low-melting metal having a

melting point of 700 degrees C or below at a temperature below the melting point of the low-melting metal under heat and pressure. (See Abstract)

The targets obtained according to the present invention can be recycled after use by pressing them together with newly powder of the same composition to compensate for their regional losses from consumption in the same manner as the production and are therefore economically advantageous. (Page 7 lines 6-8)

In the step for bonding a target and a backing plate, a target obtained according to the present invention can be bonded to a backing plate by pressing the target placed on the backing plate in the same manner as in its production without suffering heat of several hundreds degrees C, which is employed in the usual bonding processes. (Page 4 lines 24-25)

Nakagama et al. is discussed above and teach utilizing powder to recycle targets. (See Nakagama et al. discussed above) The powder is the same powder that is utilized in making the target and thus would have a microstructure the same as the initial powder utilized to make the target. (See Nakagama et al. discussed above)

The motivation for utilizing powder to recycling the target is that it is economically advantageous. (Page 7 lines 6-8)

Michaluk et al. teach high purity tantalum metals and alloys. The high purity, tantalum can be utilized as a sputter target. The high purity tantalum is made from powder and melted to form the sputter target. The high purity tantalum preferably has a fine and uniform microstructure. (See Abstract)

The tantalum powder can be melted a number of ways such as a vacuum arc remelt or an electron beam melting. (Column 9 lines 4-5) As to the atmospheres involved since Michaluk et al. teach utilizing vacuum during arc melting a vacuum atmosphere would be obvious. As to the inert atmosphere the vacuum atmosphere is believed to read on the inert atmosphere limitation.

With respect to taking this ingot and forming a sputtering target, the follow process can be used. The sputtering target made from the high purity tantalum metal can be made by mechanically or chemically cleaning the surface of the tantalum metal. (Page 10 lines 14-16) The plate can be mechanically or chemically cleaned again and formed into the sputtering target having any desired dimension. (Page 11 lines 3-4) The mechanically cleaning to form the target into the desired dimension is presumed to encompass machining, sanding or abrasion etching since these are all mechanical shaping processes.

The motivation performing the steps of Michaluk et al. is that it allows formation of a high purity target. (See Abstract)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Wollenberg by utilizing a powder for recycling and by utilizing powder of the same microstructure as taught by Nakagama et al. and by utilizing a target made of tantalum, by removing excess material for shaping, by utilizing an electron beam for melting, by utilizing a vacuum atmosphere for melting and by utilizing an inert atmosphere for melting as taught by Michaluk et al. because it allows for providing an economic advantage and production of high purity targets.

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wollenberg in view of Nakagawa et al. and Michaluk et al. as applied to claims 1-6, 8-13 and 15-24 above, and further in view of Uesawa et al. (Japan 06-158300).

The difference not yet discussed is plasma deposition.

Uesawa et al. teach depositing on a consumed part of a sputter target by plasma CVD utilizing tungsten hexafluoride and hydrogen. (See Abstract)

The motivation for recycling is that it allows for economically produce a target. (See Abstract)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was have utilized plasma deposition to recycle targets as taught by Uesawa et al. because it allows for economically producing a target.

### ***Response to Arguments***

Applicant's arguments filed 10-20-03 have been fully considered but they are not persuasive.

The rejections under 35 U.S.C. 112 second paragraph have been overcome.

The rejections of claims 1-2 under 35 U.S.C. 103 over Nakagama (EP 0 834 594) have been overcome based on the fact that Nakagama does not teach rejuvenating the sputtering target without separating the backing plate from the tantalum sputtering plate.

The rejections of claims 1-2 as obvious over Heindel (DE 19626732) in view of Michaluk (WO 00/031310) have been overcome based on the fact that Heindel fail to

disclose rejuvenating refractory metal targets and teaches conditions which teach away from rejuvenating refractory metal targets.

***RESPONSE TO THE ARGUMENTS OF THE 35 U.S.C. 103 REJECTION OF CLAIMS 1-6, 8-13 AND 15-24 AS OBVIOUS OVER WOLLENBERG IN VIEW OF NAKAGAMA AND MICHALUK:***

In response to the argument that Wollenberg does not teach incremental addition of new material to rejuvenate a target it is argued that Applicant's claims do not require incremental addition of material to the target.

In response to the argument that since the melting point of Ta is high one of ordinary skill in the art would not have expected Wollenberg's process to be successful it is argued that Wollenberg's process would be successful as long as the tantalum would be melted to fill in the worn portions of the target.

In response to the argument that Michaluk does not relate to rejuvenating the target and therefore teaches away from practicing Applicant's invention it is argued that Michaluk was relied upon to teach that the target could be made of tantalum, utilizing material removal, utilizing electron beam melting, utilizing a vacuum atmosphere for melting and utilizing an inert atmosphere for melting. Wollenberg was relied upon to teach rejuvenating through melting. (See Wollenberg and Michaluk discussed above)

In response to the argument that Nakagama's target is completely different from Applicant's invention it is argued that Nakagama was relied upon to teach a powder for recycling and for utilizing powder of the same microstructure. (See Nakagama discussed above)



In response to the argument that Nakagama does not teach rejuvenating a sputtering target without separating the backing plate from the tantalum sputtering target it is argued that Wollenberg in Figure 2 require that the target be attached to the backing plate when recycling. (See Wollenberg discussed above)

***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rodney G. McDonald whose telephone number is 571-272-1340. The examiner can normally be reached on M- Th with Every other Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam X. Nguyen can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 571-272-1300.



Rodney G. McDonald  
Primary Examiner  
Art Unit 1753

RM  
January 26, 2004